VAPOR MITIGATION SCIENCES LLC
YOUR SOLUTION TO VAPOR INTRUSION

TECHNICAL MEMORANDUM

To: Cynthia Woo, Aptim **Date:** 5/18/2022

From: Bill Morris, Vapor Mitigation Sciences, LLC

Project: Former TRW Microwave Site, Sunnyvale, California

Subject: Review of Proposed Modification to a Passive VI Mitigation System Installed at the Site listed above in Sunnyvale, CA

This memo serves to provide my professional opinion on the proposed changes to the existing passive mitigation systems installed at the site referenced above. Vapor Mitigation Sciences's (VMS) task was to review several documents regarding the passive system and proposed modifications to the passive system installed previously at the above reference building.

Documents reviewed are as follows:

- Memorandum from Mathew Plate, regarding the "*Passive Sub Slab Depressurization (SSD) System Operation and Maintenance Plan (Document Control Number [DCN] FY22SEMD_161) and Evaluation of Passive SSD System, Former TRW Microwave Site, Sunnyvale, California*"
- A letter to Mr. Kurt Batsel, dated October 7, 2021, regarding the "*EPA Site Visit and Vapor Intrusion Field Assessment, 8256 Stewart Avenue, Sunnyvale, CA, TRW Microwave Superfund Site (CERCLIS ID# CAD009159088)*"
- A Northrop Grumman / AECOM Document dated March 31, 2022, regarding the "*Passive Sub Slab Depressurization System, Operation and Maintenance Plan, Former TRW Microwave Site, 825 Stewart Drive, Sunnyvale, CA*"
- A Northrop Grumman / AECOM Document dated April 15, 2022, regarding the "*Evaluation of Passive Sub Slab Depressurization System, Former TRW Microwave Site, 825 Stewart Drive, Sunnyvale, CA*"

My comments will be general in nature and if a comment is addressing a specific portion of any of the above documents it will be so noted. Firstly, I would like to point out that I disagree with the terminology used when identifying the system installed at the site. In my opinion, there is no such thing as a passive sub-slab depressurization (SSD) system. It would be impossible to show any depressurization occurring under the slab even with the turbines rotating. These turbines may provide upwards of 0.2 inches of water column vacuum at the riser and it would certainly be very difficult to measure sustained negative pressure differentials under the slab caused by the system. The system should be called a sub-slab venting system not an SSD system.

I agree with the points that Mathew Plate had in his memorandum. In the Michael Schulman letter to the PRP regarding the SSD system vent pipes and HVAC operations. In addition to the requested building test and balance information for the HVAC Systems, it would be prudent to make sure that you get this information from varying weather conditions. Since we are relying on the stack effect and wind to provide "depressurization" we would like to understand what the building pressure are during various weather conditions (i.e., windy vs. no wind days, high pressure vs. low pressure days, etc.). The final item to consider regarding the weather is what happens on the roof when there are temperature inversions. From experience, low exhaust flow and concentrated effluents can and do get pushed back down to the roof and have a potential to re-entrain into the building through intakes on the roof.

Comments regarding the overall design are the spacing on the passive legs seem to be at varying distances. For new construction, when designing a passive system, I would have soil gas collection mat spaced on the 10 foot to center spacing with no additional venting medium. I do not use sand as a venting medium and overall coverage through sand depends highly on its' moisture content. A passive system will have minimal flows to thoroughly dry the sand out under the entire slab, especially at some of the spacing (> 30 feet) shown in the design. The spacing at several of these locations indicate the need for an active system rather than a passive system.

To summarize, quit calling the system a passive "depressurization" system and call it a passive venting system, which is what it is. Adding additional pipe will impact the system some, however, the flows from these types of systems are very low and the impact will be minimal to the overall flow. I do not want that to be confused with I don't believe the system should be active and not passive. The discharge of the pipes needs to be above the screen walls to be exposed to the wind as much as possible and ensure there is no chance of re-entrainment into the building. If the system is made active, I would still recommend the exhaust points to be above the screen wall. Depending on the flow rate, I would also consider adding a booster fan to the exhaust to increase the velocity of the exhaust and dilute the concentrations above the building and to prevent potential re-entrainment during temperature inversions.